

(No Model.)

2 Sheets—Sheet 1.

J. E. SPANOGHE.
STEAM BOILER.

No. 527,459.

Patented Oct. 16, 1894.

Fig. 2.

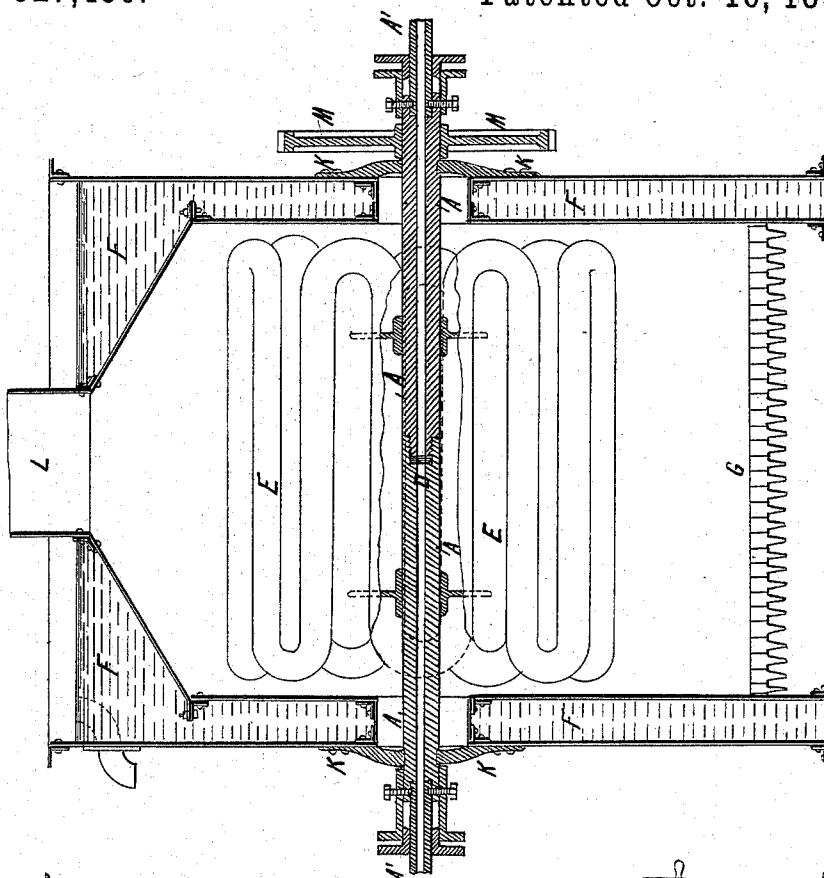
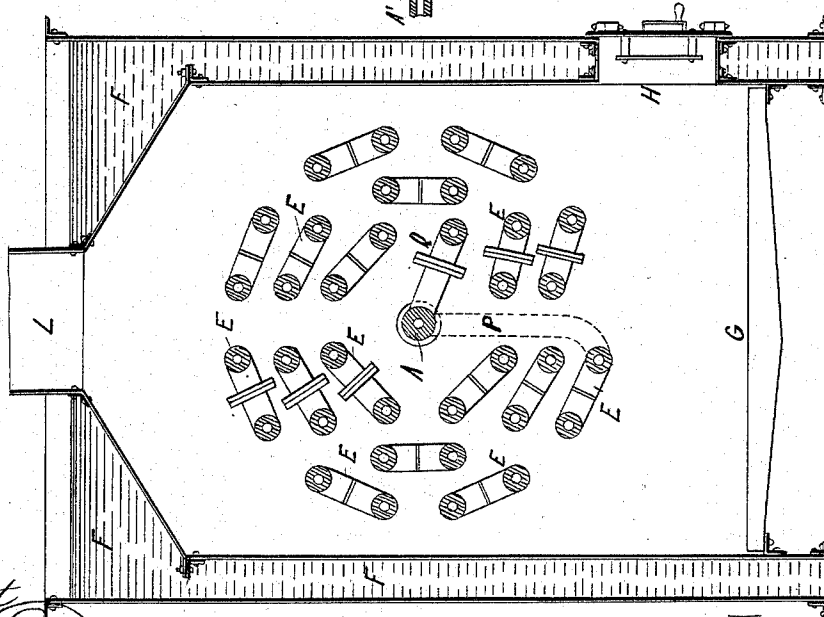


Fig. 1.



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by Richard & Co.
ATTY

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2 Sheets—Sheet 2.

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Fig. 4.

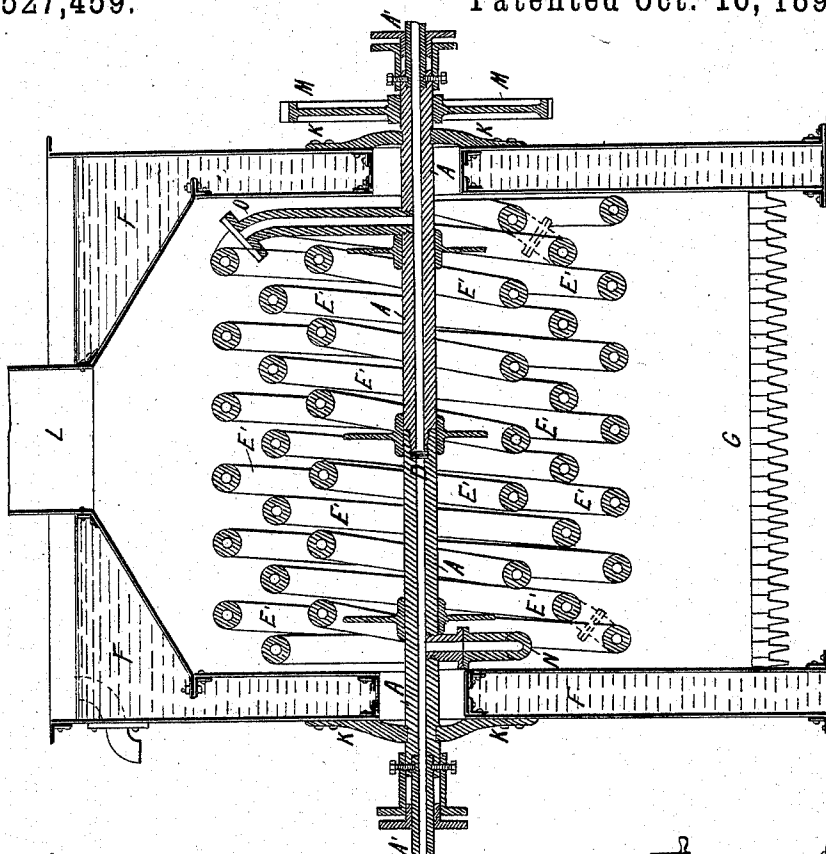
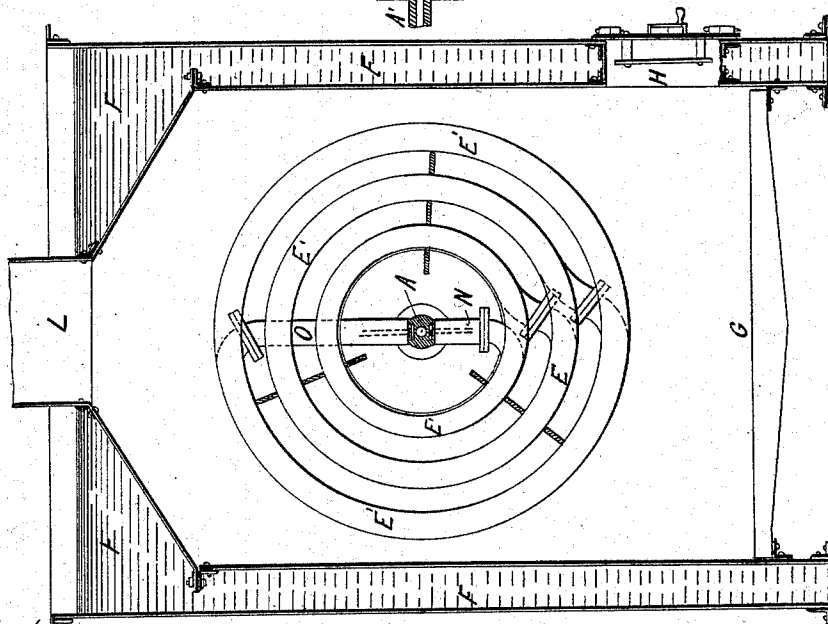


Fig. 3.



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Attys

UNITED STATES PATENT OFFICE.

JOSSE EGIDE SPANOGHE, OF ANTWERP, BELGIUM.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 527,459, dated October 16, 1894.

Application filed July 10, 1893. Serial No. 480,032. (No model.)

To all whom it may concern:

Be it known that I, JOSSE EGIDE SPANOGHE, a subject of the King of the Belgians, residing at Antwerp, in Belgium, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification.

The object of this invention is to provide a steam generator which will instantly furnish steam and will be economical and safe against explosion.

The essential feature consists in constructing the steel tubes, the walls of which are preferably very thick, in comparison with the diameter, in the form of a continuous range of tubes, which may be arranged in different ways, for instance as a spiral or serpentine bundle, so that the whole range of tubes can be rotated about a shaft within the boiler and directly above the furnace. Both ends of the range of tubes are connected with the hollow shaft so that the hot water from the water chamber or boiler enters the tubes at one end and the high pressure steam leaves them at the other end. The revolving shaft is provided at both ends with stuffing boxes so that the entrance of the hot water from the boiler into the hollow shaft and the escape of the high pressure steam from the tubes can take place without loss or difficulty.

In the accompanying drawings: Figure 1, is a vertical section of, a water chamber or boiler with revolving tubes. Fig. 2, is a vertical section through the revolving shaft. The tubes are preferably arranged in serpentine form around the shaft, so as to be parallel with it. Figs. 3 and 4 are also vertical sections, but the tubes are arranged in three helical coils around the shaft.

In Figs. 1 and 2 A is the hollow shaft carried in bearings K. It is composed of two parts and the inner bore is cut off at D.

G is the grate. The fire burning thereon heats the water inclosed in the water chamber F and heats the tubes E by its flames. The heating gases escape above through a chimney L. From the water chamber F a tube conduit passes to the left hand stuffing box A' of the revolving shaft A, and the hot water so conveyed enters the bore of A and

on reaching the middle part D, passes through a tube socket Q (see Fig. 1) into the first tube. It thence circulates all through the tubes and is transformed into high pressure steam. The steam leaves the tubes through the passage P and enters the right hand bore of the shaft A which is separated at D from the left hand bore and passes out of the boiler through the right hand stuffing box A'.

During the circulation of the water through the tubes the shaft may be revolved by a pulley M or other suitable device so that the superheating process takes place uniformly.

The furnace is charged with fuel through the fire-door H.

The same process for generating steam takes place in the modification shown in Figs. 3 and 4. The hot water leaving the water chamber E enters through A' and A on the left hand side into the socket N and into the inner coil of tubes E' circulating through these tubes till it reaches the last tube on the right hand side. Here it enters into the second coil of tubes circulating through these also, till it reaches the last tube on the left hand side. It now enters the third or outer coil of tubes from whence it passes through a socket O into the right hand portion of the revolving shaft A leaving the boiler through A'. The water tubes are in this case indicated by the letter E' all other letters remaining the same as before.

I claim—

In combination in a steam generator, the hot water chamber F, the heating chamber inclosed thereby, the pipe extending through the heating chamber and divided into two parts by a central partition, the inlet end of said pipe being connected with the hot water chamber and a coil of pipe one end of which is connected with the inlet end of the partitioned pipe, the other end of said coil being connected with the outlet end of the said pipe, substantially as described.

In testimony whereof I have hereto set my hand in the presence of the two subscribing witnesses.

JOSSE EGIDE SPANOGHE.

Witnesses:

GE. F. LINCOLN,
WILLIAM HAINE.